

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

RECEIVED

JUN 21 2005

BROMBERG & SUNSTEIN

SCANSOFT, INC.,

Plaintiff,

v.

C.A. No. 04-10353-PBS

VOICE SIGNAL

TECHNOLOGIES, INC.,

LAURENCE S. GILLICK,

ROBERT S. ROTH,

JONATHAN P. YAMRON,

and MANFRED G. GRABHERR,

Defendants.

PRESUMED CONFIDENTIAL UNTIL 7/6/2005
PURSUANT TO PROTECTIVE ORDER

ORIGINAL

DEPOSITION OF MANFRED G. GRABHERR, Ph.D., a
witness called by and on behalf of the Plaintiffs,
taken pursuant to the applicable provisions of the
Federal Rules of Civil Procedure, before Dana Welch,
CSR, Registered Professional Reporter, and Notary
Public, in and for the Commonwealth of Massachusetts,
at the offices of Bromberg & Sunstein, 125 Summer
Street, Boston, Massachusetts, on June 16, 2005,
commencing at 10:04 a.m.

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1 I N D E X
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WITNESS: MANFRED G. GRABHERR, Ph.D.

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5 E X H I B I T S

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1 P R O C E E D I N G S

2 (The Massachusetts Driver's License
3 number as identification of the deponent
4 was noted for the record.)

5 WHEREUPON,

6 MANFRED G. GRABHERR,
7 having duly sworn or affirmed that his
8 testimony would be the truth, the whole truth,
9 and nothing but the truth, testified as
10 follows:

11 DIRECT EXAMINATION

12 BY MS. FLEMING:

13 Q. Would you state your name for the
14 record please and spell it.

15 A. My name is Manfred Gernot Grabherr.
16 It's M-A-N-F-R-E-D, G-E-R-N-O-T,
17 G-R-A-B-H-E-R-R.

18 Q. And that's Dr. Grabherr, right?

19 A. Yes.

20 Q. Dr. Grabherr, I would like for you to
21 tell me about your educational background after
22 high school and with your collegiate studies.

23 A. I studied physics at the Technische
24 Universitat Wien, which is the University of

1 computational biology is a very new field which
2 tries to bring together people from different
3 backgrounds. So they want to combine biology
4 with people who know how to write -- to use a
5 computer to do research in the area of -- well,
6 genome research, for instance.

7 So the problem there is that you have a
8 lot of data. If you look at a genome, then the
9 human genome is about three billion letters
10 long, bases. So you need computers to do
11 anything to search or sort of analyze it. So
12 that's the sort of thing.

13 Q. And were you hired by the Broad
14 Institute because you have knowledge and
15 background in computers?

16 MR. POPEO: Objection. Answer the
17 question, if you can.

18 THE DEPONENT: It was a requirement to
19 know how to work with computers.

20 BY MS. FLEMING:

21 Q. It was a requirement?

22 A. Yes.

23 Q. Okay. Now, how long have you been
24 employed at the Broad Institute?

1 MR. POPEO: Objection to form. You can
2 answer the question.

3 THE DEPONENT: That's how one can track
4 changes, but I hardly ever use this.

5 BY MS. FLEMING:

6 Q. Okay. But a source, a source control
7 system that you described, would in your
8 experience, is that typically maintained by
9 software companies?

10 MR. POPEO: Object to the form of the
11 question. If you're capable of answering
12 that question, you may do so.

13 THE DEPONENT: A source control system
14 is designed to let companies keep track of
15 their changes they do during software
16 development; that's one of the things; I
17 mean, there's more things, too.

18 BY MS. FLEMING:

19 Q. And the Broad Institute maintains such
20 a source control system; is that your
21 testimony?

22 A. Yes.

23 Q. Now, if you would look at paragraph 2
24 of your affidavit. This indicates that you

1 or correct my question.

2 MR. POPEO: It's only because there's
3 the transcript that she's taking down, so
4 we want Ms. Fleming to finish her question
5 so we can read it clean.

6 BY MS. FLEMING:

7 Q. So again, as I understand your
8 testimony, you did not provide Mr. Roth with a
9 copy of your vitae or resume. Mr. Roth did not
10 ask you about the work that you did at Lernout
11 & Hauspie. But during that interview he
12 offered you a position with Voice Signal
13 Technologies. Is that your testimony?

14 MR. POPEO: Object to the form of the
15 question as it assumes a fact not in
16 evidence. You can respond to the question,
17 if you can.

18 THE DEPONENT: I did not understand you
19 correctly when you said vitae. So I'm sure
20 I gave him some form of a resume of all my
21 previous positions, which basically said,
22 well, I worked in speech recognition at
23 this company, I worked at speech
24 recognition at that company and I worked,

1 his testimony.

2 MR. POPEO: Object to form. That
3 mischaracterizes the testimony.

4 THE DEPONENT: Yeah. If there was ever
5 some doubt, I would assume that it's
6 confidential.

7 BY MS. FLEMING:

8 Q. And did you treat that minor
9 modification that you made at Lernout & Hauspie
10 as confidential?

11 A. Yes.

12 Q. And you never disclosed it to anyone?

13 A. No.

14 Q. Did you disclose it to anyone at
15 Lernout & Hauspie?

16 A. I don't recall. Probably.

17 Q. And what did your minor modification to
18 the short list do, what did it achieve?

19 MR. POPEO: Object to the form. Answer
20 the question, if you can.

21 THE DEPONENT: So from what I remember,
22 I don't remember the specific details, but
23 from what I remember, it reduced the memory
24 usage.

1 you mean in some commercial sense it's
2 beneficial?

3 MR. POPEO: Object to the form of the
4 question. If you know the answer, you may
5 answer.

6 THE DEPONENT: Yes, because ultimately,
7 you don't want speech recognition systems
8 that run on super-high-end computers. You
9 want speech recognition systems that, you
10 know, run on regular PCs; at least that was
11 the goal of Lernout & Hauspie.

12 BY MS. FLEMING:

13 Q. And that was an important goal to the
14 company, wasn't it?

15 MR. POPEO: If you know.

16 THE DEPONENT: In this -- I don't
17 remember what the fact was of this
18 modification. It was not a major thing.
19 It was not something that would make or
20 break, you know, the ability to run on a
21 PC. But a speech recognition system is a
22 very complex thing and you have many, many
23 different --

24

1 MR. POPEO: Whether or not -- the
2 nature of the communications that I've had
3 with my client are not a topic of discovery
4 or discussion today.

5 MS. FLEMING: You're disclosing on the
6 record now that you will produce that
7 document on the basis that it's relevant?

8 MR. POPEO: If the document exists, I
9 will determine whether it does exist, and
10 if so, if it responds to any discovery in
11 the case, then we will produce it.

12 BY MS. FLEMING:

13 Q. Dr. Grabherr, do you recall the
14 substance of the agreement that you signed with
15 Kurzweil?

16 MR. POPEO: Objection. You can answer,
17 if you can.

18 THE DEPONENT: I don't remember.

19 BY MS. FLEMING:

20 Q. Was it an employment agreement?

21 A. It was an employment agreement.

22 Q. Did it offer you employment?

23 A. I don't remember what the document
24 said.

1 Q. Did it contain any obligations to keep
2 information confidential that you obtained in
3 your employment with Kurzweil?

4 MR. POPEO: Objection. Only if you
5 remember.

6 THE DEPONENT: I don't remember.

7 BY MS. FLEMING:

8 Q. You don't remember?

9 A. I don't remember any specific things
10 about this document.

11 Q. You don't remember if you were under
12 any obligations to keep information
13 confidential while you worked at Kurtzweil?

14 MR. POPEO: That wasn't the question.
15 That's a different question. You can
16 answer that question, if you know the
17 answer to it.

18 THE DEPONENT: It very much depends on,
19 you know, what the document says and what
20 the wording is. I assume that there was
21 something in there that --

22 MR. POPEO: Just what you remember,
23 please.

24

1 BY MS. FLEMING:

2 Q. Let's put the document aside. Do you
3 remember or do you recall whether you were
4 under any obligation to maintain as
5 confidential any information you received as
6 part of your employment with Kurzweil?

7 MR. POPEO: Object to the form. Do you
8 recall, that's the question.

9 THE DEPONENT: I recall that was my
10 understanding that I should keep
11 confidential information confidential.

12 BY MS. FLEMING:

13 Q. Okay. And is it your understanding
14 that Lernout & Hauspie acquired Kurzweil after
15 you received that Kurzweil agreement?

16 MR. POPEO: Objection. Asked and
17 answered.

18 MS. FLEMING: That wasn't asked and
19 answered.

20 BY MS. FLEMING:

21 Q. You can answer.

22 A. I don't remember exactly that the flow
23 of events was. So again, it might have been
24 Kurzweil when I signed this; it might have been

1 Q. What in particular did you do for
2 Lernout & Hauspie?

3 MR. POPEO: Object to the form. Answer
4 if you can.

5 THE DEPONENT: Okay. So from what I
6 remember, I worked on two projects. Again,
7 I worked in the recognition development
8 group. So I worked on Voice Xpress. I
9 think there were different versions of
10 Voice Xpress. And at some point I worked
11 at the Phoenix project.

12 BY MS. FLEMING:

13 Q. What was the Voice Xpress project?

14 A. Voice Xpress is a large-vocabulary
15 dictation speech recognition system. And --
16 sorry. Can you say the question again?

17 MS. FLEMING: Can you read it back,
18 please.

19 (Preceding question was read by the
20 stenographer.)

21 THE DEPONENT: Okay. Voice Xpress was
22 -- was a product that would allow users to
23 use a microphone and use a large-vocabulary
24 continuous speech recognizer to enter text

1 been developed mostly by research people in the
2 beginning. And the reason why this would be
3 desirable is that at some point I remember it
4 became really hard to maintain the code base.

5 So whenever a new algorithm would
6 become available, then it was very hard to put
7 it in because the design was -- it was just not
8 well designed at all. And it was a very kind
9 of monolithic thing. And there was this desire
10 to make the structure more modular, just more
11 maintainable.

12 Q. Well, wasn't, in fact, the Phoenix
13 project designed to rewrite Voice Xpress for
14 hand-held units?

15 MR. POPEO: Object to the form of the
16 question. If you agree with that, you can
17 say so.

18 THE DEPONENT: The second purpose of
19 Phoenix was to be able to run speech
20 recognition on hand-held computers. There
21 was kind of this -- the second idea behind
22 this project.

23 BY MS. FLEMING:

24 Q. And you worked on Voice Xpress?

1 point became known as ELVIS. And I don't know
2 exactly when it made the transition from just
3 being a recognizer to being ELVIS.

4 Q. Okay. And what language model was used
5 in the ELVIS technology that you're aware of
6 from October of 2000 to October of 2001?

7 MR. POPEO: I object the form of
8 question. You may answer -- you may
9 answer --

10 MS. FLEMING: Mr. Popeo, please.

11 MR. POPEO: You may answer if you can
12 do so without divulging any Voice Signal
13 trade secret. With that instruction, you
14 can go ahead.

15 THE DEPONENT: Sorry. The question
16 again, please?

17 THE REPORTER: "Question: 'Okay. And
18 what language model was used in the ELVIS
19 technology that you're aware of from
20 October of 2000 to October of 2001?'"

21 THE DEPONENT: This kind of a language
22 model was the just straightforward thing
23 that's published, that stores probabilities
24 for words and word translations.

1 believe was proprietary.

2 BY MS. FLEMING:

3 Q. And is it your testimony that the
4 storage of language models at Lernout & Hauspie
5 was not proprietary to Lernout & Hauspie?

6 A. I don't think -- it was not
7 proprietary.

8 Q. You think it was proprietary?

9 A. No. I think it was not proprietary.

10 Q. So I just want to be clear that I
11 understand your testimony, that the way that
12 Voice Signal Technologies, as you understand
13 it, stored its language models was proprietary,
14 but the way that Lernout & Hauspie stored its
15 language models was not; is that your
16 testimony?

17 A. Yes.

18 MR. POPEO: Objection.

19 THE DEPONENT: Because it's different.

20 BY MS. FLEMING:

21 Q. Why is it different?

22 MR. POPEO: You can answer the question
23 without talking about Voice Signal's
24 methodology.

1 MS. FLEMING: Excuse me. Mr. Popeo,
2 have you just instructed the witness not to
3 talk about Voice Signal's technology with
4 respect to language models in the first
5 year of employment of Mr. Grabherr?

6 MR. POPEO: I'm just reminding him not
7 to disclose trade secrets of Voice Signal.
8 But you can answer the question.

9 THE DEPONENT: Okay. So --

10 MS. FLEMING: You're reminding him not
11 to disclose trade secrets within the first
12 year of his employment; is that -- am I
13 understanding your instruction?

14 MR. POPEO: The witness may be capable
15 of answering the question without
16 disclosing trade secrets.

17 MS. FLEMING: No. Is your instruction
18 that he not disclose trade secrets during
19 the first year of his employment at Voice
20 Signal Technologies; Is that your
21 instruction, Mr. Popeo?

22 MR. POPEO: My instruction to the
23 witness and general instruction is that he
24 not disclose trade secrets as a general

1 matter.

2 MS. FLEMING: Despite the Court's order
3 in this case?

4 MR. POPEO: I'm not aware of any court
5 order that says that we ought to be
6 disclosing trade secrets.

7 THE DEPONENT: I think I can answer the
8 question without disclosing confidential
9 information.

10 So you have to keep in mind that these
11 recognizers are really intended for very
12 different purposes.

13 BY MS. FLEMING:

14 Q. What recognizers?

15 A. So on one hand, you have L&H Voice
16 Xpress, and also later on, the Phoenix
17 recognizer, and the intention there was to run
18 in a -- in an environment in which you have an
19 operating system, you have file storage of some
20 sort, you have a pretty fast processor and you
21 have a lot of memory.

22 Now, on the other hand, if you look at
23 the ELVIS recognizer, that was designed to run
24 on embedded systems such as cell phones, where

1 MR. POPEO: Objection. You can answer
2 the question.

3 THE DEPONENT: I'm sorry. Can you
4 rephrase that?

5 BY MS. FLEMING:

6 Q. You testified earlier that you had
7 access to Voice Signal Technologies source
8 code; is that right?

9 A. I had access to source, yes.

10 Q. The speech recognition source code?

11 A. At Voice Signal?

12 Q. Yes.

13 A. Yes.

14 Q. Okay. And were there components of
15 that source code that disclosed what the
16 acoustic modeling was?

17 MR. POPEO: Object to the form. You
18 can answer it if you can.

19 THE DEPONENT: I don't know if I can
20 answer this question. I mean, in the sense
21 that -- so it used this triphone
22 clustering. So if you look at the source
23 code, you will probably be able to tell
24 that it's a triphone-based system and not

1 Q. Okay. I'd ask you just to focus on the
2 first sentence here and ask you, what work did
3 you specifically do to research and develop
4 robust speech interfaces to mobile and embedded
5 products at Voice Signal Technologies?

6 MR. POPEO: Object to the form of the
7 question. You can answer. Please restrict
8 your answer to the first 12 months after
9 you were hired and don't disclose Voice
10 Signal trade secrets in the process.

11 THE DEPONENT: So the question is what
12 project was I working on; is that correct?

13 BY MS. FLEMING:

14 Q. No. The question is a little bit more
15 specific than that. What work did you do to
16 research and develop robust speech interfaces
17 to mobile and embedded products?

18 MR. POPEO: Same objection. You can
19 answer.

20 THE DEPONENT: Okay. Yeah, when I
21 started working for Voice Signal, there
22 were a number of things Voice Signal wanted
23 to do and all of them were for embedded
24 applications.

1 BY MS. FLEMING:

2 Q. You don't know how to spell his last
3 name, do you?

4 A. I do, actually. It's
5 Z-L-O-K-A-R-N-I-K.

6 Q. Anybody else?

7 A. I hope I got it right.

8 Q. That's okay. We can correct it.
9 Anyone else?

10 A. There was Bahman Farahani.
11 B-A-H-M-A-N, F-A-R-A-H-A-N-I.

12 Q. Anyone else?

13 A. Yes. There was Paul Silvis.

14 Q. S-I-L-V-I-S.

15 A. Ark Khasin. A-R-K, K-H-A-S-I-N.

16 Q. N or M?

17 A. N.

18 Q. Okay.

19 A. And --

20 MR. POPEO: Only if you can recall.
21 It's not a memory test.

22 THE DEPONENT: Okay. So I think there
23 might have been other people, but I don't
24 remember. I think there was the core

1 group.

2 BY MS. FLEMING:

3 Q. You don't remember? Upon that
4 instruction of your counsel, you don't remember
5 any other names?

6 MR. POPEO: I object to the
7 characterization.

8 THE DEPONENT: No. Wait, wait, wait.

9 MR. POPEO: If you can recall, then you
10 should tell her. If you can't recall, then
11 you should tell her you can't recall.

12 THE DEPONENT: It was a fairly small
13 team and you have, including myself, five
14 people already and I think that was about
15 right. There might have been some other
16 people getting pulled into this every once
17 in a while. I don't think there were any
18 kind of regular people on the team.

19 BY MS. FLEMING:

20 Q. Do you know the names of the people
21 that might have been pulled in that might not
22 have been regular members of the team?

23 A. Well, one of them --

24 MR. POPEO: I object. Don't guess. If

1 you know, you may answer the question.

2 THE DEPONENT: One of them I remember
3 is Jim McGinnis.

4 BY MS. FLEMING:

5 Q. Tim?

6 A. Jim. M-C-G-I-N-N-I-S. I hope that's
7 the proper spelling. And for the more
8 technical questions, we also had embedded
9 engineers help us; but those I don't remember
10 specifically.

11 Q. Okay. And can you tell me what your --
12 specifically what your work was on this team?

13 A. So my work on this team was to
14 contribute to the design process and also
15 implement certain parts.

16 Q. Okay. Let take each of those tasks
17 that you just described. What did you do
18 specifically to contribute to the design
19 process of the recognizer?

20 MR. POPEO: Objection. Please restrain
21 yourself to the first 12 months after you
22 were hired and please don't disclose any
23 trade secrets.

24 THE DEPONENT: I don't remember the

1 specific things that I contributed. This
2 was -- we had a lot of meetings where we
3 were just talking. And I can't really say
4 whose idea was what. And sometimes that's
5 also not the way it works, because somebody
6 says, oh, I have an idea, and somebody else
7 says, oh, that doesn't work, but if we do
8 this then all of a sudden this becomes a
9 more feasible thing to do.

10 BY MS. FLEMING:

11 Q. And did you understand when you were
12 having those meetings that you were sharing
13 confidential information?

14 MR. POPEO: Object to the form of the
15 question. If you understand it, you can
16 answer.

17 THE DEPONENT: You mean confidential
18 information from who?

19 BY MS. FLEMING:

20 Q. From anyone on the team.

21 MR. POPEO: Same objection. If you
22 understand you can answer.

23 THE DEPONENT: I don't -- can you
24 rephrase the question?

1 BY MS. FLEMING:

2 Q. Sure. When you worked on this team and
3 you were part of this team, was it your
4 understanding that you were developing -- well,
5 in fact, you said you were developing a speech
6 recognizer, correct?

7 A. Yes.

8 Q. And you were contributing to the design
9 process of that speech recognizer, correct?

10 A. Yes.

11 Q. And as part of your contributions to
12 the design process, did you understand that the
13 information you were developing was
14 confidential to Voice Signal Technologies?

15 A. Yes. That was my understanding, right.

16 Q. And what information in particular was
17 confidential if you can recall?

18 MR. POPEO: I object to the form of the
19 question. If you can answer the question
20 without divulging the confidential
21 information itself, you can do so.

22 THE DEPONENT: Well, a lot of it is,
23 well, how do you actually make this run in
24 very little memory. So rather than --

1 there are two ways to approach this. And
2 one is to start with something that's big
3 and make it small; and the other one is
4 start with something that's supposed to be
5 small in the beginning. And the second way
6 is usually what works much better.

7 So a lot of this means you have to
8 structure things in certain ways so that
9 you keep one part of information here and
10 another part of the information there.
11 Because the hope is that, you know, if you
12 also have to distinguish between memory
13 you can write to and memory you cannot
14 write to. And you don't want to keep
15 anything you don't -- are not going to
16 modify in memory you can write to because
17 that's precious. And so that requires you
18 to structure this in a certain way.

19 BY MS. FLEMING:

20 Q. What way?

21 MR. POPEO: Objection. Again, if you
22 can answer the question without divulging
23 trade secrets, you may do so. But please
24 don't describe a trade secret.

1 THE DEPONENT: So it can -- you have to
2 organize your memory so that you're not
3 wasting anything, there is no overhead. So
4 one classical thing is you have an array of
5 things and you want to look up information
6 in there. Sometimes it's helpful if you
7 have something like an index table where
8 you say, oh, I'll just look up the index
9 first, that gets me right to where I want
10 to get this information, right.

11 So it's like, you know, if you have a
12 phone directory, then you can look it up --
13 maybe that's not a good analogy. But
14 anyway. But it makes it much faster, but
15 you have to be willing to spend the memory
16 on your index table.

17 BY MS. FLEMING:

18 Q. How does it make it faster?

19 A. The alternative is if you do it the
20 simple way, you have to go through each
21 individual entry that you're looking for and
22 that takes a long time if you have a record of
23 these things.

24 Q. And what method did this team employ to

1 make it go faster?

2 MR. POPEO: Object to the form. You
3 may answer the question, but please don't
4 divulge a trade secret when you do so.

5 THE DEPONENT: No. I'm just using this
6 as an example. So I'm not saying this is
7 one of the particular problems.

8 BY MS. FLEMING:

9 Q. Let me ask you a question, sir. In
10 forming your answer to this question and the
11 previous two questions, have you -- is part of
12 your answer based on confidential information
13 that you have not disclosed to me?

14 MR. POPEO: Object to the form of the
15 question. If you understand it, you can
16 answer it.

17 THE DEPONENT: Well, a lot of it has to
18 do with the fact that I just can't remember
19 the specifics of what we did. I mean, if
20 you ask me -- if you tell me now, show me
21 the source code and say, oh, okay.

22 BY MS. FLEMING:

23 Q. If I showed you the source code?

24 A. If you showed me the source code and

1 tell me, well, this is the way you did it, I
2 would say yes, now I remember. But out of the
3 top of my head, I just don't remember these
4 things because they're very -- sometimes very
5 small details.

6 Q. Sure. So without looking at the source
7 code, you can't recall what the specific
8 contributions were this team made in the early
9 speech recognition engine that was being
10 developed as part of this team that you just
11 testified about?

12 MR. POPEO: Object to the form of the
13 question. It mischaracterizes. You can
14 answer the question if you can.

15 THE DEPONENT: And one thing that I
16 remember is that we went through each
17 possible data structure and tried to figure
18 out how can we organize this such that it
19 takes up the least amount of memory.

20 BY MS. FLEMING:

21 Q. And do you recall what techniques you
22 came up with?

23 MR. POPEO: Object to the form. Again,
24 if you can answer the question without

1 divulging a trade secret you may do so.

2 BY MS. FLEMING:

3 Q. Can you answer that question with
4 divulging a trade secret?

5 MR. POPEO: In other words, if you're
6 remembering a trade secret --

7 MS. FLEMING: Excuse me, sir; it's my
8 question.

9 THE DEPONENT: No, I understand. No, I
10 don't think I could.

11 BY MS. FLEMING:

12 Q. You can't answer that question with or
13 without confidential information?

14 A. Right.

15 MS. FLEMING: Okay. Can you read me
16 back the question?

17 THE REPORTER: "Question: 'And do you
18 recall what techniques you came up with?'"

19 BY MS. FLEMING:

20 Q. Why can't you answer that question?

21 A. Because I simply don't remember. I
22 mean, see, these are very detailed things that
23 we did.

24 Q. And you can't remember unless you

1 recall the specific techniques that the team
2 came up with in those early stages to build the
3 speech recognition engine; is that right?

4 A. That's right.

5 Q. And it would be helpful if you had the
6 source code to look at to determine whether it
7 would refresh your memory, correct?

8 MR. POPEO: Object to the form of the
9 question. You can answer it, if you can.

10 THE DEPONENT: If I were to look at the
11 source code, then probably a lot of it
12 would come back, yes.

13 BY MS. FLEMING:

14 Q. Okay. Now --

15 MR. POPEO: Let's take a break whenever
16 you have a chance. It's after 1:00.

17 MS. FLEMING: Do you want to take a
18 lunch break. It's 1:00 now.

19 THE DEPONENT: That would be good.

20 MS. FLEMING: How long would you need?

21 MR. POPEO: 45 minutes maybe.

22 MS. FLEMING: So we'll come back
23 at 1:45.

24

1 So what people have found to be helpful
2 for speech recognition is to look at, let's say
3 three of these vectors at a time, and also
4 compute the differences between them. And they
5 call it the deltas because it's kind of a
6 difference. It basically says well, how much
7 do the values change over time.

8 Q. Uh-huh.

9 A. Right. And then there's another
10 technique which some people use, others
11 don't --

12 Q. Before you move on, are you moving off
13 of what is a generic speech recognizer into
14 something else?

15 A. No. It's just -- I mean, a generic
16 speech recognizer, there are many techniques
17 that people choose to use or don't use.

18 Q. But if I understand your testimony up
19 to the point of describing vectors, you've
20 given me a piece of what the recognizer does,
21 is that right, a very small piece?

22 A. A generic recognizer, yes.

23 Q. And --

24 MR. POPEO: I think he's trying to tell

1 you that there might be more than one
2 generic approach. But you can answer.

3 BY MS. FLEMING:

4 Q. And when these vectors -- when the
5 recognizer has these vectors that it has
6 comprised, are they associated with some
7 probability?

8 A. No. Well, these vectors, what they
9 represent at that point is how much of the
10 speech signal is in a certain frequency range.
11 So I don't know how one would introduce
12 probabilities at this point.

13 Q. Okay. Then I misunderstood. So let
14 me --

15 A. Okay.

16 Q. What is the next piece of what happens
17 in a speech recognizer once the vectors are
18 determined?

19 A. Right. So a generic recognizer for
20 being able to recognize something, needs a --
21 some sort of vocabulary. Right. So what is a
22 vocabulary. A vocabulary is sometimes usually
23 how the word is spelled, so you want to keep
24 this information because you want to know what

1 embedded products. And you were describing the
2 different products that Voice Signal
3 Technologies, to your understanding, had at the
4 time you joined the company.

5 Did -- to your knowledge did Voice
6 Signal Technologies have any embedded products
7 in the automotive field or for use in
8 automobiles?

9 MR. POPEO: Objection. Answer --

10 THE DEPONENT: To the best of my
11 knowledge, no.

12 BY MS. FLEMING:

13 Q. Okay. Now, the second question -- I'm
14 sorry -- the second statement in that
15 description says that "Your work will focus on
16 challenges of implementing multilingual large-
17 and small-vocabulary speech engines on embedded
18 platforms." Do you see that?

19 A. Yes.

20 Q. Okay. And can you tell me what work
21 specifically you did to focus on those
22 challenges?

23 MR. POPEO: Object to the form of the
24 question. You can answer it, if you can.

1 might make sense to run a large-vocabulary on?

2 MR. POPEO: As of the date of the
3 agreement?

4 BY MS. FLEMING:

5 Q. At the time you were reviewing this job
6 description.

7 A. I can't remember any other devices.

8 Q. And so I ask you now, what work you did
9 in particular to focus on those challenges?

10 MR. POPEO: Object to the form of the
11 question. You may answer, if you can.

12 THE DEPONENT: So we already talked
13 about the design process. And I did the
14 implementation of some source code in their
15 ELVIS recognizer.

16 BY MS. FLEMING:

17 Q. And when you say you did the
18 implementation of some source code, what do you
19 mean by that, sir?

20 A. I wrote parts of ELVIS.

21 Q. What parts of ELVIS did you write?

22 MR. POPEO: Objection. You may answer.
23 Please restrain yourself to the first 12
24 months after you were hired.

1 it might be different triphones, you start
2 splitting them. And by doing that you can --
3 you get this restructure.

4 And you start searching at the
5 beginning, the roots of the tree. And once you
6 determine that a certain path, no matter how
7 many words end there are at the leaf outs, once
8 you determine that, there's no point in
9 searching any further because the scores have
10 gone too bad, then you can stop there.

11 Q. So the idea is to eliminate some of
12 those hypotheses, isn't it?

13 A. Yes.

14 Q. Then you can go through the tree faster
15 than if you had all those hypotheses in there
16 that you had to go through, right?

17 A. Right. Because you don't have that
18 many root nodes, so it doesn't make much sense
19 to search the word "green" and then "greedy"
20 twice if they're the same at the beginning; so
21 you can reduce the number of hypotheses.

22 Q. And how do you write code to build a
23 lexical tree?

24 MR. POPEO: Object to the form. You

1 can answer, if you can.

2 THE DEPONENT: So what you do is
3 probably you take the first word of your
4 dictionary. You take the second word of
5 your dictionary and compare it to the first
6 one. If they're totally different, then
7 you have two different entries. Now you
8 have two root nodes.

9 Then you take the third word. And you
10 say, well, can I match this in here? No.
11 Can I match this in here? Yes. But they
12 split after the second phoneme. Then you
13 take the next word out of your dictionary
14 and you just build this lexical tree.

15 BY MS. FLEMING:

16 Q. And is that how you built the lexical
17 tree for this particular module for ELVIS?

18 MR. POPEO: Objection to form.

19 THE DEPONENT: I don't remember that.

20 It might be.

21 BY MS. FLEMING:

22 Q. You don't remember how you built it?

23 A. I might have done just that. I don't
24 remember if I did anything else.

1 about how you build a lexical tree.

2 A. The algorithm that I just described is
3 one algorithm to build a lexical tree. All
4 right. Now, one can think of different
5 algorithms of building a lexical tree. Like
6 you can, for instance, take your vocabulary and
7 sort it which makes it somewhat easier; so
8 that's another way of building this.

9 And I'm sure you can come up with very
10 different ways of building trees that are not
11 known to the public domain. But again, as long
12 as you end up with the same tree.

13 Q. Understood. And you said that you can
14 build it in such a way that it becomes easier.
15 What do you mean by that?

16 MR. POPEO: Objection to form. Answer,
17 if you can.

18 THE DEPONENT: Okay. What I -- it's
19 not -- okay. If you sort the dictionary
20 before, you do the same thing that I
21 described before. Then what happens is
22 that you don't have to search all the root
23 nodes necessarily in order to build this,
24 which might make it a tiny little bit

1 BY MS. FLEMING:

2 Q. I imagine that all of these scores are
3 computed.

4 A. Yes.

5 Q. And then you're left in the module with
6 a number of scores?

7 A. Yes.

8 Q. And in order for the scores to have any
9 meaning, are they plotted on some kind of a
10 distribution graph?

11 MR. POPEO: Objection.

12 THE DEPONENT: No. They were just used
13 as absolute values.

14 BY MS. FLEMING:

15 Q. As absolute values. And how do you --
16 what's the next step in the speech recognition
17 process once those scores are computed?

18 MR. POPEO: Objection. I just want to
19 clarify -- not trying to step on your
20 question. Are you talking about the
21 generic recognition process?

22 MS. FLEMING: All related to the work
23 that he wrote for ELVIS prototype.

24 THE DEPONENT: Okay. From what I

1 remember, the way it works is --

2 MR. POPEO: And again, I caution you
3 not to disclose any trade secrets.

4 THE DEPONENT: So my recollection is
5 that after you compute the scores, what you
6 do in the search is you want to add them up
7 over time to get an accumulated score for a
8 whole hypothesis. Right. And now, from
9 time to time you might decide to just, you
10 know, remove the bottom of the score.

11 So if the scores are 1,005, 1,010,
12 1,015, it's the same as, I don't know, 2,
13 5, 15; so the thousands don't matter
14 because you only compare hypotheses against
15 each other. Whether I did that or not, I
16 don't remember.

17 BY MS. FLEMING:

18 Q. Now, in the answer that you just stated
19 for the record, did you withhold any trade
20 secret information from your answer?

21 MR. POPEO: Object to the form. You
22 can answer, if you can.

23 THE DEPONENT: No, I don't think so.

24

1 BY MS. FLEMING:

2 Q. You don't think so, but you may have?

3 A. What I was just talking about, about
4 adding the scores? No. There was nothing.

5 Q. And what do you know about -- what do
6 you know about Gaussian curves as they relate
7 to speech recognition?

8 MR. POPEO: Object to the form of the
9 question. You may answer the question, if
10 you can.

11 THE DEPONENT: That's a term used to,
12 as far as I know, to describe the theory
13 about speech recognition where you have
14 mixtures and Gaussians. But in practical
15 terms, what it comes down to is you have
16 these two vectors and you compare them and
17 you compute a score based on some sort of a
18 distance measure.

19 BY MS. FLEMING:

20 Q. And that distance measure, does it look
21 like a Gaussian curve?

22 MR. POPEO: Objection.

23 THE DEPONENT: I don't really know what
24 you mean by that.

1 BY MS. FLEMING:

2 Q. And that's how it works in a generic
3 recognizer; is that right?

4 A. This is something that's also common to
5 most recognizers of this work.

6 Q. And is that how it worked in the ELVIS
7 prototype?

8 A. Yes.

9 Q. Okay. And is that how it worked in the
10 Phoenix project?

11 MR. POPEO: Objection.

12 THE DEPONENT: Yes.

13 BY MS. FLEMING:

14 Q. Okay. And those model states, do they
15 have an associated probability distribution
16 function?

17 MR. POPEO: Object to the form of the
18 question. You may answer, if you can.

19 THE DEPONENT: I don't know what you
20 mean by probability distribution function.

21 BY MS. FLEMING:

22 Q. Have you ever heard that term?

23 A. I think I have, yeah.

24 Q. In what context?

1 A. I don't remember.

2 Q. Have you ever heard the term PDF?

3 A. I don't think so. Oh, is it the
4 acronym for probability -- oh, okay. Sorry.

5 MR. POPEO: That's okay. You just
6 answer the best you can. If you haven't
7 heard it, you haven't heard it.

8 THE DEPONENT: Okay.

9 BY MS. FLEMING:

10 Q. Did the ELVIS prototype that you worked
11 on in your first year at Voice Signal
12 Technologies model duration of speech?

13 MR. POPEO: Object to the form of the
14 question.

15 THE DEPONENT: Can you rephrase the
16 question, please?

17 BY MS. FLEMING:

18 Q. Well, are you familiar with the term
19 duration modeling?

20 A. If by that -- I mean, I wouldn't use
21 this terminology, but if by that, you mean the
22 problem of -- well, if you're talking about
23 speech recognition, one of the problems is that
24 not everybody says the same word at the same

1 BY MS. FLEMING:

2 Q. Yes.

3 A. Okay. No, there is not.

4 Q. So ELVIS does not use duration
5 modeling?

6 A. It does use duration modeling, but it
7 does not use a certain probability assigned to
8 whether it's better to stay within a state or
9 transition to another state.

10 Q. Why not?

11 MR. POPEO: Object to the form of the
12 question. You may answer, if you can do so
13 without divulging a trade secret.

14 THE DEPONENT: I don't know.

15 BY MS. FLEMING:

16 Q. You don't know or you can't divulge it
17 without involving a trade secret?

18 A. I don't know. I don't think it helps
19 much with the recognition process. This is
20 just something that people tried to increase
21 accuracy and I don't know how much that helps
22 at all, if it helps at all.

23 Q. Whether it helps or not, does the ELVIS
24 prototype use that type of duration modeling?

1 MR. POPEO: Objection. Asked and
2 answered.

3 THE DEPONENT: No.

4 BY MS. FLEMING:

5 Q. It doesn't?

6 A. It doesn't.

7 Q. But it uses duration modeling?

8 MR. POPEO: Objection.

9 THE DEPONENT: Yes. That's what the
10 hidden Markov model is all about.

11 BY MS. FLEMING:

12 Q. How did the ELVIS prototype model
13 duration?

14 MR. POPEO: Object to the form of the
15 question. You can answer, if you can
16 without divulging trade secrets.

17 THE DEPONENT: This is the process that
18 I just described.

19 BY MS. FLEMING:

20 Q. And the process you just described --

21 A. It's the basic --

22 MR. POPEO: Generic.

23 THE DEPONENT: Well, it's the way in
24 which hidden Markov models work. And these

1 that your testimony is that the ELVIS prototype
2 did not employ that kind of duration modeling,
3 that is, with the penalties and the
4 probabilities?

5 MR. POPEO: Objection. Asked and
6 answered. You may answer again.

7 THE DEPONENT: Right. So -- it did
8 not.

9 BY MS. FLEMING:

10 Q. It did not?

11 A. It did not employ this penalties in the
12 transitions.

13 Q. Now, I asked you earlier if you were
14 familiar with the term mixture modeling; do you
15 remember that?

16 A. Yes.

17 Q. Okay. Does mixture modeling employ the
18 use of triphone clustering?

19 MR. POPEO: Object to the form of the
20 question. You can answer if you can.

21 THE DEPONENT: I don't understand the
22 question.

23 BY MS. FLEMING:

24 Q. So I take it if I asked you if mixture

1 that describes.

2 Q. What's your understanding of it?

3 MR. POPEO: Objection. You can provide
4 your understanding.

5 THE DEPONENT: Okay. My understanding
6 is that it's a name for one of Voice
7 Signal's products, but I don't know exactly
8 what's in there.

9 BY MS. FLEMING:

10 Q. During the time you were employed by
11 Voice Signal Technologies, do you know if ELVIS
12 was ever licensed to anyone?

13 MR. POPEO: Objection to the form of
14 the question. If you know.

15 THE DEPONENT: So that's during my
16 entire time of --

17 BY MS. FLEMING:

18 Q. Yes.

19 MR. POPEO: Let's answer within the
20 first 12 months of your employment, please.
21 The question is do you know?

22 THE DEPONENT: Do I know if it was
23 commercially employed?

24

1 questions, and of course, if you can't answer a
2 question because you haven't read the document,
3 please let me know that.

4 A. Okay.

5 Q. Does this application for an invention
6 describe any product of Voice Signal
7 Technologies?

8 MR. POPEO: Object to the form of the
9 question. The document speaks for itself.
10 But you can answer it if you can.

11 THE DEPONENT: I'm sorry. Can you ask
12 me the question again?

13 BY MS. FLEMING:

14 Q. Sure. You're a co-inventor on this
15 patent application; is that right?

16 A. Right.

17 Q. And do you know whether this patent --
18 well, do you know whether this patent or the
19 invention that's described in the patent
20 describes any product of Voice Signal
21 Technologies?

22 MR. POPEO: Object to the form of the
23 question. You may answer.

24 THE DEPONENT: I'm not familiar with

1 recording and playback." Do you see that?

2 A. Yes.

3 Q. Did I read that accurately?

4 A. I think so, yeah.

5 Q. Having read the abstract with me, can
6 you tell me what contributions to this patent
7 application you, yourself, have made?

8 MR. POPEO: Object to the form of the
9 question. And I object to the extent that
10 you read from the abstract, but not from
11 the claims of the patent application,
12 itself. But if you can answer the
13 question, you may do so.

14 THE DEPONENT: This is -- I don't think
15 I really can answer this question, what
16 specific contributions I made. I mean, if
17 you look at the abstract, this covers a
18 whole variety of things; some of them I
19 have some vague understanding what they
20 describe, and others, I just have no idea
21 what they are.

22 BY MS. FLEMING:

23 Q. Well, let's go through them and see
24 what you have a vague understanding of.

1 THE DEPONENT: I'm sorry; can you
2 rephrase that?

3 BY MS. FLEMING:

4 Q. Sure. Did you make some contributions
5 at Voice Signal Technologies about the
6 development of that correction mode?

7 MR. POPEO: Object to the question.
8 Are you now talking generically at Voice
9 Signal Technologies rather than with
10 respect to the claims of this patent?

11 MS. FLEMING: No, with respect to this
12 patent.

13 MR. POPEO: So just focus with respect
14 to contributions which you may have made on
15 the claims of the patent application.

16 THE DEPONENT: Okay. So if you're
17 talking about the actual user interface,
18 then I don't think I made any contribution
19 there.

20 BY MS. FLEMING:

21 Q. Okay. Is this an application for a
22 user interface?

23 MR. POPEO: Objection. If you know.

24 THE DEPONENT: To me, it looks like

1 you see that?

2 A. Yes.

3 Q. What does that mean to you?

4 MR. POPEO: Object to the form of the
5 question. The document speaks for itself.
6 If you can, answer it.

7 THE DEPONENT: I don't know what that
8 means.

9 BY MS. FLEMING:

10 Q. You don't know. How about the next
11 one: "Responding to the generation of the
12 first user input by performing
13 large-vocabulary, recognizing on one or more
14 utterances in a prior language,
15 context-dependent mode, which recognizes at
16 least the first word of such recognition,
17 depending in part on language model context
18 created by a previously recognized word." Do
19 you see that?

20 A. Yes.

21 Q. Do you understand what that means?

22 MR. POPEO: Same objection. This is a
23 legal document which speaks for itself.
24 You can answer it, if you can.

1 THE DEPONENT: So what it might mean,
2 but this is just really speculation, is
3 there might be some context in which --
4 allows you to use a language model score
5 based on what the previous word on the
6 screen is.

7 BY MS. FLEMING:

8 Q. Did you, Dr. Grabherr, make any
9 contributions to this patent or this invention
10 that are described in that section that I just
11 read to you and you just testified to about?

12 MR. POPEO: Object to the form of the
13 question.

14 THE DEPONENT: I can't really --

15 MR. POPEO: If you recall, you may
16 answer.

17 THE DEPONENT: I can't -- I can't
18 really tell what that is, what it means. I
19 mean, I don't know for sure what this
20 really is talking about.

21 BY MS. FLEMING:

22 Q. And am I correct that your
23 understanding of looking at this patent
24 application is that this is an application for

1 Q. Okay. And would you agree with me that
2 you were sent a copy of this electronic mail?

3 A. Yes, that's what it looks like.

4 Q. Your name is down there as a recipient,
5 isn't it?

6 A. Yes.

7 Q. And this electronic mail indicates --
8 well, in the electronic mail, Mr. Gillick
9 states, "We are presently working on an ELVIS
10 patent that we would like to file by early in
11 September"; is that right?

12 A. Yes.

13 Q. And the purpose of the meeting is "To
14 either identify novel technical characteristics
15 in our current implementation of ELVIS or to
16 come up with other novel ideas that would be
17 important contributions to ELVIS." He goes on
18 to say, "We are specially interested in
19 innovations that facilitate large-vocabulary
20 recognition in a hand-held device with flash."
21 Did I read that accurately?

22 A. Yes.

23 Q. Is this electronic mail inviting you
24 to a meeting?

1 MR. POPEO: Object to the form of the
2 question. Document speaks for itself. But
3 you can answer, if you know.

4 THE DEPONENT: That's what it looks
5 like.

6 BY MS. FLEMING:

7 Q. And do you recall attending such a
8 meeting where the ELVIS patent was discussed?

9 A. I don't remember.

10 Q. You don't remember. Do you recall
11 participating in any meetings in which any
12 patents of Voice Signal Technologies were
13 discussed?

14 MR. POPEO: Object to the form of the
15 question.

16 THE DEPONENT: Within the duration of
17 the first year?

18 MR. POPEO: Yes.

19 BY MS. FLEMING:

20 Q. If that's how you intend to answer the
21 question.

22 MR. POPEO: That is how he's instructed
23 to answer the question.

24 THE DEPONENT: Okay. In the first

1 it's still there.

2 BY MS. FLEMING:

3 Q. And personal digital assistants have
4 technology for flash as well, don't they?

5 MR. POPEO: Object to the form of the
6 question. You may answer it, if you know.

7 THE DEPONENT: I don't know.

8 BY MS. FLEMING:

9 Q. Mini computer?

10 A. Mini computers?

11 MR. POPEO: Same objection.

12 BY MS. FLEMING:

13 Q. You don't know what a mini computer is?

14 A. No.

15 Q. Flash technology used on personal
16 computers?

17 A. Probably not.

18 Q. So your testimony is flash technology
19 is only used on cell phones?

20 MR. POPEO: Objection.

21 THE DEPONENT: That's what I believe,
22 yeah.

23 BY MS. FLEMING:

24 Q. On what do you base that belief?

1 A. Well --

2 MR. POPEO: Object to the form.

3 Answer, if you can.

4 THE DEPONENT: Okay. So you need
5 permanent -- so flash is some sort of a
6 kind of like a permanent storage, right.
7 So it's some sort of an attempt to make up
8 for the nonexistent hard disk drive; right.

9 And so on a cell phone, it makes
10 perfect sense to have flash there, because
11 you do want to store certain things, data,
12 the pictures you just took or whatever,
13 somewhere where they don't get lost if you
14 turn the cell phone off.

15 Now, it wouldn't make such sense to use
16 this technology on a PC, because usually
17 these things are not huge and it's much,
18 much cheaper to have a large hard disk
19 drive where you can store all your data and
20 it's going to still be there, even if you
21 turn it off.

22 On the PDA, I'm not sure because what
23 you do is you have a lot of memory anyway
24 already there, whether it makes sense to

1 have it, I don't know, whether they have it
2 or not, I don't know.

3 BY MS. FLEMING:

4 Q. You just don't know?

5 A. I just don't know.

6 Q. And you are -- let me just ask you.

7 You did not -- or did you communicate to Mr.

8 Bob Roth any novel technical characteristics in
9 the current implementation of ELVIS?

10 MR. POPEO: Object to the form.

11 Answer, if you recall, please.

12 THE DEPONENT: I don't remember.

13 BY MS. FLEMING:

14 Q. And did you communicate to Mr. Roth any
15 novel ideas that would be important
16 contributions to ELVIS?

17 MR. POPEO: Same objection.

18 THE DEPONENT: I don't remember.

19 BY MS. FLEMING:

20 Q. Did you ever communicate to Mr. Bob
21 Roth in your first year of employment at Voice
22 Signal Technologies?

23 A. Communicate, meaning talking?

24 Q. Any communication.

1 MR. POPEO: I object. The witness is
2 instructed only to disclose those matters
3 on which he worked during the 12-month
4 period after he was first hired by the
5 company.

6 BY MS. FLEMING:

7 Q. Can you answer that question?

8 MR. POPEO: If you know, please.

9 THE DEPONENT: So in the first year, I
10 don't remember what I worked on with him.
11 I don't remember when he started either,
12 so --

13 BY MS. FLEMING:

14 Q. At any time that you worked at Voice
15 Signal Technologies, do you remember working
16 with Mr. Yamron on particular projects?

17 A. Yes.

18 Q. You do?

19 A. I remember -- sure, I don't remember
20 all of it, but I remember particular things.

21 Q. Is there any particular piece of work
22 that you can testify to today having worked on
23 with Mr. Yamron at Voice Signal Technologies?

24 MR. POPEO: Object to the form, which

1 design document. And he raises a few points
2 about the master wordlist design in general.
3 It was not uncommon at Voice Signal to discuss
4 certain things. So you were not actually
5 working on something, but you were talking
6 about something.

7 Q. Is it fair to say he was eliciting
8 answers from you about some of his questions
9 here?

10 MR. POPEO: Object to the form of the
11 question. If you know the answer to that
12 question, you can answer.

13 THE DEPONENT: Well, I don't remember.
14 Just by reading it, this is what it looks
15 like.

16 BY MS. FLEMING:

17 Q. Do you remember if you responded to his
18 electronic mail?

19 A. I don't remember.

20 Q. He asks in the first bullet of his
21 comments here, do these formatting properties
22 belong in master wordlist, and if not, where do
23 they go? Do you see that?

24 A. Yes.

1 Q. Do you know what's prompting him to ask
2 that question?

3 MR. POPEO: Object to the form of the
4 question. You're asking whether this
5 witness knows what prompted Jon Yamron to
6 ask that particular question?

7 MS. FLEMING: Yes.

8 MR. POPEO: If you know the answer, you
9 may answer.

10 THE DEPONENT: I don't remember.

11 BY MS. FLEMING:

12 Q. And you can't tell from the text that's
13 written above his question what's prompting him
14 to ask that question?

15 MR. POPEO: Same objection. Don't
16 guess. If you know, you may answer.

17 THE DEPONENT: I would have to guess.

18 BY MS. FLEMING:

19 Q. And the second bullet, Mr. Yamron
20 states, "We should be cautious about not
21 hard-coding restrictions on the ranges of
22 various quantities." Do you see that?

23 A. Yes.

24 Q. Then he says "e.g., unigram scores,

1 class IDs"?

2 A. Yes.

3 Q. What's your understanding of unigram
4 scores?

5 MR. POPEO: Objection. You may answer.

6 THE DEPONENT: I know what a unigram
7 score is, which is a form of language model
8 score or it's derived from a probability.
9 Now, again, I can just read this and then
10 try to make a guess on what he is talking
11 about.

12 BY MS. FLEMING:

13 Q. Well, I don't want you to guess, but
14 I'd like to know what your understanding of the
15 phrase "class IDs" refers to, or class I-D-S?

16 A. That I don't know.

17 Q. You don't know. Is there any reason
18 that Mr. Yamron would have included you in this
19 electronic mail distribution listed based on
20 the fact that this discussed a design document?

21 MR. POPEO: Object to the form of the
22 question. If you know, you can answer.

23 THE DEPONENT: It's possible. I don't
24 remember.

1 tokenization mean anything to you?

2 MR. POPEO: Object to the form. You
3 can answer.

4 THE DEPONENT: Tokenization is -- okay.
5 This is my -- what it could be. So
6 tokenization in this context could refer to
7 text preprocessing, or postprocessing for
8 that matter.

9 BY MS. FLEMING:

10 Q. Does it have any significance in speech
11 recognition?

12 MR. POPEO: Object to the form of the
13 question. If you know, please.

14 THE DEPONENT: Well, what -- it's used
15 for different things really. So it's --
16 from what I remember, it's the technique of
17 taking, for instance a text file with
18 punctuations and separating the
19 punctuations from the preceding words
20 because there's no space between them,
21 something like that. It could just mean
22 you have some stream, cut it up into
23 certain pieces.

24

1 Q. Do you remember receiving a copy of
2 this document?

3 A. I don't remember receiving it.

4 Q. Do you remember participating in a
5 meeting about the master wordlist on May 8th,
6 2001?

7 MR. POPEO: Object to the form.

8 THE DEPONENT: I don't remember.

9 BY MS. FLEMING:

10 Q. Okay. In the text of the communication
11 from the person whose name is redacted, it
12 says, "Can we get together briefly, say for a
13 half hour at 4:00 tomorrow to talk about this
14 and to resolve the issue of associating unigram
15 scores with pronunciations." Did I read that
16 correctly?

17 A. Yes.

18 Q. And then in parentheses following that,
19 it says, "LG and MG have differing opinions
20 about this"; is that right?

21 A. Yes.

22 Q. Is the MG referred to there you?

23 MR. POPEO: Objection. If you know.

24 THE DEPONENT: Well, I mean, I don't

1 means.

2 BY MS. FLEMING:

3 Q. The very first line on the document
4 underneath the date says, "some initial project
5 assignments," right?

6 A. Right.

7 Q. Then your name appears?

8 A. Yes.

9 Q. And there are three lines of text, one
10 I just read, "implement on-line implementation
11 via"?

12 A. Right.

13 Q. The second says, "implement on-line
14 adaptation"?

15 A. Yes.

16 Q. And the third says, "adding and
17 removing words from pronunciation tree,"
18 correct?

19 A. Yes.

20 Q. Does that text indicate to you any
21 project assignments you had during your first
22 year of employment at Voice Signal
23 Technologies?

24 MR. POPEO: Object. If you recall.

1 THE DEPONENT: I don't remember what
2 this document was about.

3 BY MS. FLEMING:

4 Q. You don't remember or you've never seen
5 this document?

6 MR. POPEO: Objection.

7 THE DEPONENT: I don't remember having
8 seen this document.

9 BY MS. FLEMING:

10 Q. Does the word -- does the phrase
11 "adding and removing words from pronunciation
12 tree" have any significance to you?

13 MR. POPEO: As a generality or in the
14 context of this document?

15 BY MS. FLEMING:

16 Q. In the context of some project
17 assignments you might have received at Voice
18 Signal Technologies.

19 A. I'm not sure.

20 Q. What aren't you sure about?

21 A. I think -- well, again, I remember none
22 of this. So I mean, I can just tell you that
23 if you give me the sentence, remove words from
24 pronunciation, adding and removing words from

1 BY MS. FLEMING:

2 Q. You don't remember performing that
3 task?

4 A. Yes.

5 Q. Okay. Now, I want to go way back to
6 Exhibit 2 and ask you again to turn to the page
7 that's continuing the job description, which is
8 marked with Bates number 03738.

9 A. Yes.

10 Q. Okay. You will recall earlier we were
11 discussing in detail the job description.

12 A. Yes.

13 Q. And I asked you about the specific work
14 that you did at Voice Signal Technologies. I
15 want to -- and you answered my questions with
16 respect to the first and second sentences of
17 this paragraph.

18 I want to ask you what work did you do
19 specifically to contribute to the development
20 of novel approaches for improving human
21 interfaces to global information
22 infrastructure?

23 MR. POPEO: Object to the form of the
24 question. You may answer that, if you can.

1 Q. Can you import or port sections of
2 source code file into a data file like an LM
3 design text file?

4 MR. POPEO: Object to the form of the
5 question. If you know, please.

6 THE DEPONENT: These are just files.
7 You can rename to anything you like, any
8 source code file can be renamed to any
9 other file.

10 BY MS. FLEMING:

11 Q. Let me make sure you understand my
12 question.

13 A. Okay.

14 Q. You've just described source code files
15 that look very different from what this
16 document looks like.

17 A. Right.

18 Q. Can you copy source code lines from the
19 source code file and put it into a document
20 like the one that's marked Exhibit 11?

21 A. Yes, you can.

22 Q. You can?

23 A. Yeah.

24 Q. Okay. You named one characteristic of

1 you know you didn't do any work in it?

2 MR. POPEO: Object to the form of the
3 question. If that question is susceptible
4 to an answer, you can answer.

5 THE DEPONENT: I said I don't know what
6 this specifically refers to. It could be a
7 number of things. Now, I can tell you what
8 I think it could be.

9 MR. POPEO: Wait a second. The
10 question she's asked is how you know that
11 you didn't do any work on it? So if you
12 can answer that question, you may answer.

13 THE DEPONENT: Right. But the answer
14 is, if I tell you what it could be, then
15 those were things I did not work on.

16 BY MS. FLEMING:

17 Q. What could it be that you didn't
18 work on?

19 A. It could be that you have a language
20 model and you have some text provided by the
21 user of the speech recognizer, and in order to
22 improve recognition, you can use this text to
23 modify the language model, and therefore, more
24 -- make it more closer to the speaking style or

1 be a module.

2 Q. What does that module do?

3 MR. POPEO: Object to the form of the
4 question. Don't guess, please.

5 THE DEPONENT: I don't know.

6 BY MS. FLEMING:

7 Q. You don't know the purpose of that
8 module?

9 A. I could guess, but --

10 Q. The VSTUtil module you referred to, is
11 that part of the ELVIS speech recognition?

12 MR. POPEO: Objection. Don't guess,
13 please.

14 THE DEPONENT: I don't remember.

15 BY MS. FLEMING:

16 Q. Do you know if it's part of the user
17 interface?

18 MR. POPEO: Same objection.

19 THE DEPONENT: I don't remember.

20 BY MS. FLEMING:

21 Q. Who would know at Voice Signal
22 Technologies what the VSTUtil is?

23 MR. POPEO: Object to the form of the
24 question. If you know who would know,

1 answer, but don't guess.

2 THE DEPONENT: I don't know.

3 BY MS. FLEMING:

4 Q. Who would have known what VSTUtil was
5 during the time that you worked at Voice Signal
6 Technologies?

7 MR. POPEO: Same objection.

8 THE DEPONENT: I don't know.

9 BY MS. FLEMING:

10 Q. Was Paul Silvis involved in packaging
11 software and releasing it at Voice Signal
12 Technologies?

13 MR. POPEO: Objection. Only if you
14 know, please.

15 THE DEPONENT: I don't remember.

16 MS. FLEMING: Let's mark this one 13.

17 (Exhibit No. 13 marked for
18 identification.)

19 BY MS. FLEMING:

20 Q. Dr. Grabherr, the reporter has handed
21 you another document that's part of the Voice
22 Signal production. It's Bates marked VST
23 04051. This is an e-mail, electronic mail,
24 from Mr. Larry Gillick to the research at Voice

1 A. Yes.

2 Q. Okay. But it is true that the ELVIS
3 project was in existence prior to April 19th,
4 2001, wasn't it?

5 A. Yes.

6 Q. Okay. And what was Mr. Gillick's role
7 with respect to the ELVIS project?

8 MR. POPEO: Objection. If you know,
9 please.

10 THE DEPONENT: Larry Gillick was head
11 of the Core Technology Group at Voice
12 Signal; and so as -- in that role, he was
13 involved with the ELVIS project.

14 BY MS. FLEMING:

15 Q. And was Paul Silvis the project
16 coordinator?

17 MR. POPEO: Object to the form of the
18 question. Don't guess, please.

19 THE DEPONENT: I don't know.

20 BY MS. FLEMING:

21 Q. Was Paul Silvis involved in the ELVIS
22 project?

23 MR. POPEO: Same objection. If you
24 know. Please don't guess.

1 recognizer; is that the speech recognizer
2 that's referring to?

3 A. I would assume so.

4 Q. That's the speech, the ELVIS speech
5 engine?

6 A. I can -- I don't know what exactly this
7 is referring to. It might actually refer to a
8 part of the speech recognition engine.

9 Q. What makes you think it -- it's related
10 to a part of the engine?

11 A. I'm not saying that it does. I just
12 can't rule it out.

13 Q. In April of 2001, do you recall
14 specifically what your role was in connection
15 with the ELVIS project?

16 MR. POPEO: If you recall.

17 THE DEPONENT: I don't remember.

18 BY MS. FLEMING:

19 Q. Okay. Does the fact that your name is
20 next to "recognizer" imply anything about the
21 kind of work you did in April of 2001 when on
22 the ELVIS project?

23 MR. POPEO: Object to the form. You
24 can answer, if you understand that.

CERTIFICATE

COMMONWEALTH OF MASSACHUSETTS

SUFFOLK, SS

I, Dana Welch, Registered Professional
Reporter and Notary Public in and for the
Commonwealth of Massachusetts, do hereby
certify:

That MANFRED G. GRABHERR, the witness
whose deposition is hereinbefore set forth, was
duly sworn by me and that such deposition is a
true record of my stenotype notes taken in the
foregoing matter, to the best of my knowledge,
skill and ability.

IN WITNESS WHEREOF, I have hereunto set
my hand this 16th day of June, 2005.

DANA ULRICH WELCH

Dana Welch, RPR

Registered Professional Reporter